National Aeronautics and Space Administration
Glenn Research Center
Explore. Discover. Understand.

ACCELERATION MATCH GAME

Answer Key

http://exploration.grc.nasa.gov/physicsday

Geauga Lake

B 1. Mr. Hyde's Nasty Fall

Notice the sudden reduction of total acceleration at about t = 41 seconds, which indicates the beginning of the drop. The free fall continues for about 1.5 seconds.

F 2. Steel Venom

Notice the acceleration reductions when the train reaches the top of each hill. On the fourth time, notice the train is caught and held for a fraction of a second—the acceleration goes to -1g for a moment.

E 3. Big Dipper

This older roller coaster shows a pattern of fairly regular hills and valleys. The gradual climb up the first hill is on the left. In the middle is the long, level turn-around.

C 4. Bounty

Notice the asymmetric nature of the accelerations due to the rider sitting at one end of the boat. The feeling is different at one end of the ride than in the middle. The lower peaks would be more even if measured at the center of the boat.

D 5. Head Spin

The key feature in this roller coaster is the two groups of accelerations separated by a period of 1g. Notice the gradual climb up the first hill and then the gradual climb to the top of the second hill.

H 6. Time Warp

Notice the cyclical motion as the riders are smoothly swung around in a circular motion and turned upside-down. The left/right acceleration varies only slightly since there is no motion in that direction on this ride.

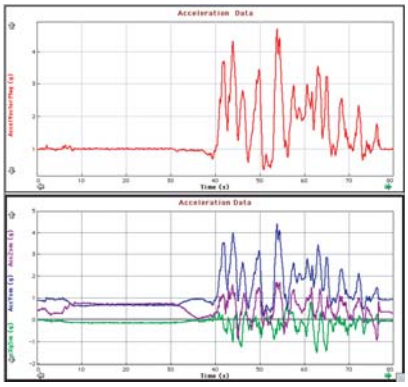
G 7. X-Flight

Notice the immediate change in the Y-axis acceleration as the rider is reclined in the station at the beginning of the ride, and the change in acceleration at the beginning up the long upward slope of altitude going up the first hill.

A 8. Thunderhawk

The vector magnitude acceleration level remains high for the ride due to the twisting motions. Several times riders feel light at the top of inversions.

A



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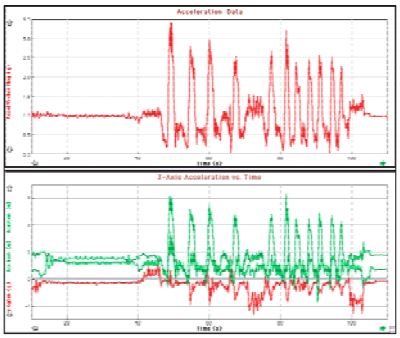

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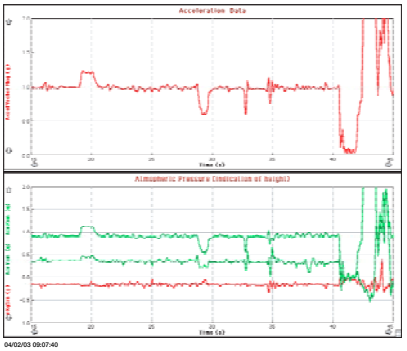

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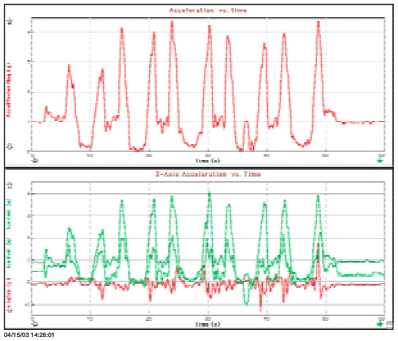

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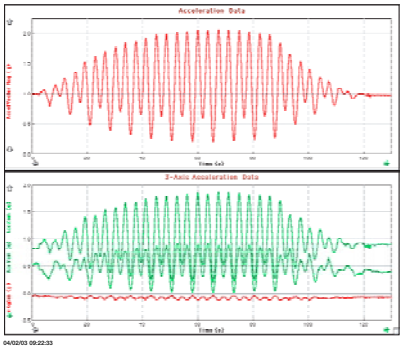

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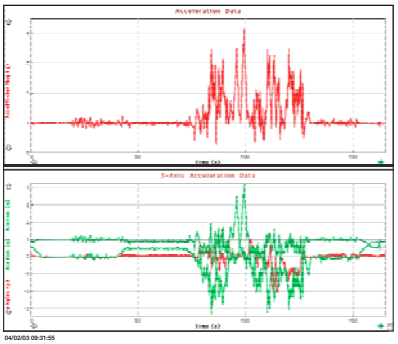

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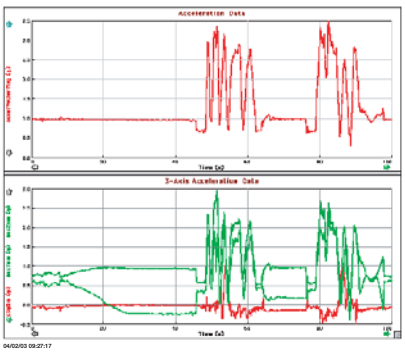

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